

VIT
 Vellore Institute of Technology
 School of Mechanical Engineering
 CONTINUOUS ASSESSMENT TEST (CAT) - I
 WINTER SEMESTER 2024-2025

SLOT: B2+TB2

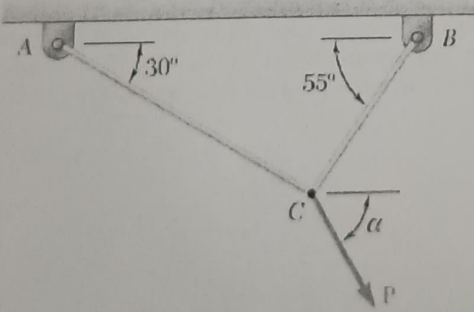
REG.NO.:

Programme Name & Branch : BTech - Mechanical Engineering
 Course Code : BMEE201L
 Course Name : Engineering Mechanics
 Faculty Name(s) : Dr. Bikash Routh, Sridharan K, Rahul Singh Sikarwar, Seenuvasaperumal P, Velu M
 Class Number(s) : VL2024250503323
 Date of Examination : 28-January-2025
 Exam Duration : 90 minutes

Maximum Marks: 50

General Instruction(s):

- Answer **all the questions**
- M - Max mark; CO - Course Outcome; BL - Blooms Taxonomy Level (1 - Remember, 2 - Understand, 3 - Apply, 4 - Analyse, 5 - Evaluate, 6 - Create)
- Course Outcomes Statements:
 CO. 1: Compute the resultant and analyse equilibrium (without and with friction) of system of forces acting on particles and rigid bodies in plane and space.
 CO. 2: Predict the support-reactions and the internal forces of the members of trusses and frames.

Q. No	Question	M	CO	BL
1.	Two cables tied together at C are loaded as shown in figure 1. Knowing that the maximum allowable tension is 2000 N in cable AC and 1000 N in cable BC, determine (a) the magnitude of the largest force P which may be applied at C, (b) the corresponding value of α  Figure-1	10	1	4
2.	Three cables are used to tether a balloon as shown in Figure 2. Determine the vertical force P exerted by the balloon at A knowing that the tension in cable AC is 800 N.	10	1	4



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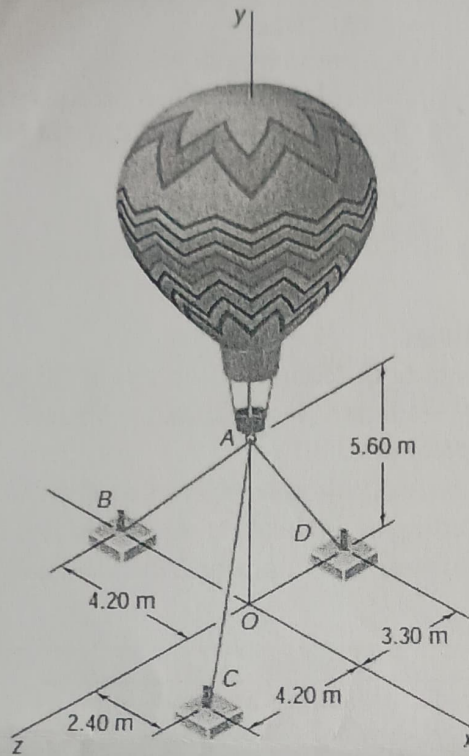


Figure-2

3. The access door as shown in figure 3 is held in the 30° open position by the chain AB. If the tension in the chain is 275 N, determine the projection of the tension force onto the diagonal axis CD of the door.

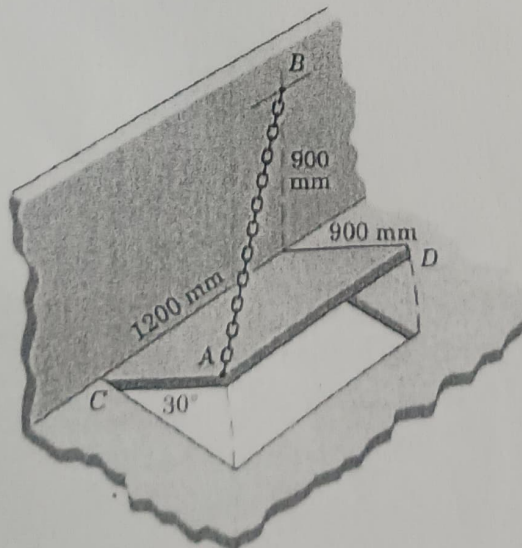


Figure-3

10

1

4



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4.

Determine and locate the resultant R of the two forces and one couple acting on beam as shown in Figure 4.

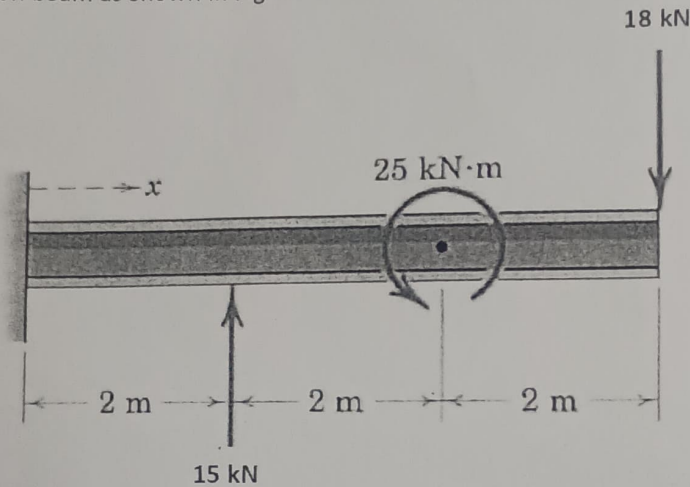


Figure-4

10

1

3

5.

Using the method of joints, determine the force in each member of the truss shown in Figure 5. State whether each member is in tension or compression.

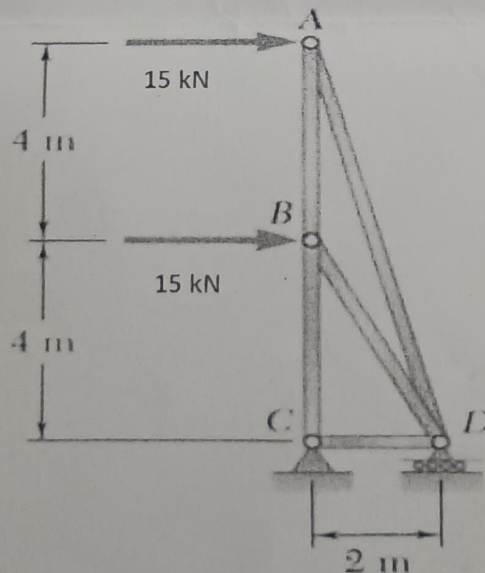


Figure-5

10

2

4